THE SEA–ROBIN *PRIONOTUS* (TELEOSTEI: SCORPAENIFORMES) IN THE PLEISTOCENE OF NEW JERSEY

By

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Abstract

Published fossil material of *Prionotus* was limited to otoliths and fragments, but is now represented by many specimens including a skull from Point Pleasant, New Jersey. The specimen, RUGMV 1, was partially enclosed in a calcareous clayey sandstone and was prepared mechanically and chemically. The skull is similar to *Prionotus evolans* in size and bone distribution, but differs in the presence of the supraoccipital on the skull table. Comparisons were made to modern specimens, and the restored fossil fish was approximately 280 mm in length. Foraminifera and comparison with beach blocks from the New Jersey coast suggest a Pleistocene age.

Introduction

The specimen described here, a skull of the sea-robin *Prionotus* (RUGMV 1), was discovered as a beach rock at Point Pleasant, New Jersey, by Mr. Kenneth Bliss of Linden, New Jersey. Skull material of *Prionotus* is reported from the Holocene of Florida (Swift & Wing, 1968), and the Eocene of England (Stinton, 1978). Fossil references to other genera of the family Triglidae are more numerous (Jordan, 1907), and the genus *Trigla* has been reported from the Miocene of Europe by Rado (1968) and Gaudant (1968). Fossil prionotids are, however, more abundant than the literature indicates. The National Museum's collection includes the following USNM specimens (Robert Purdy, personal communication):

The Mosasaur, 3:161–167
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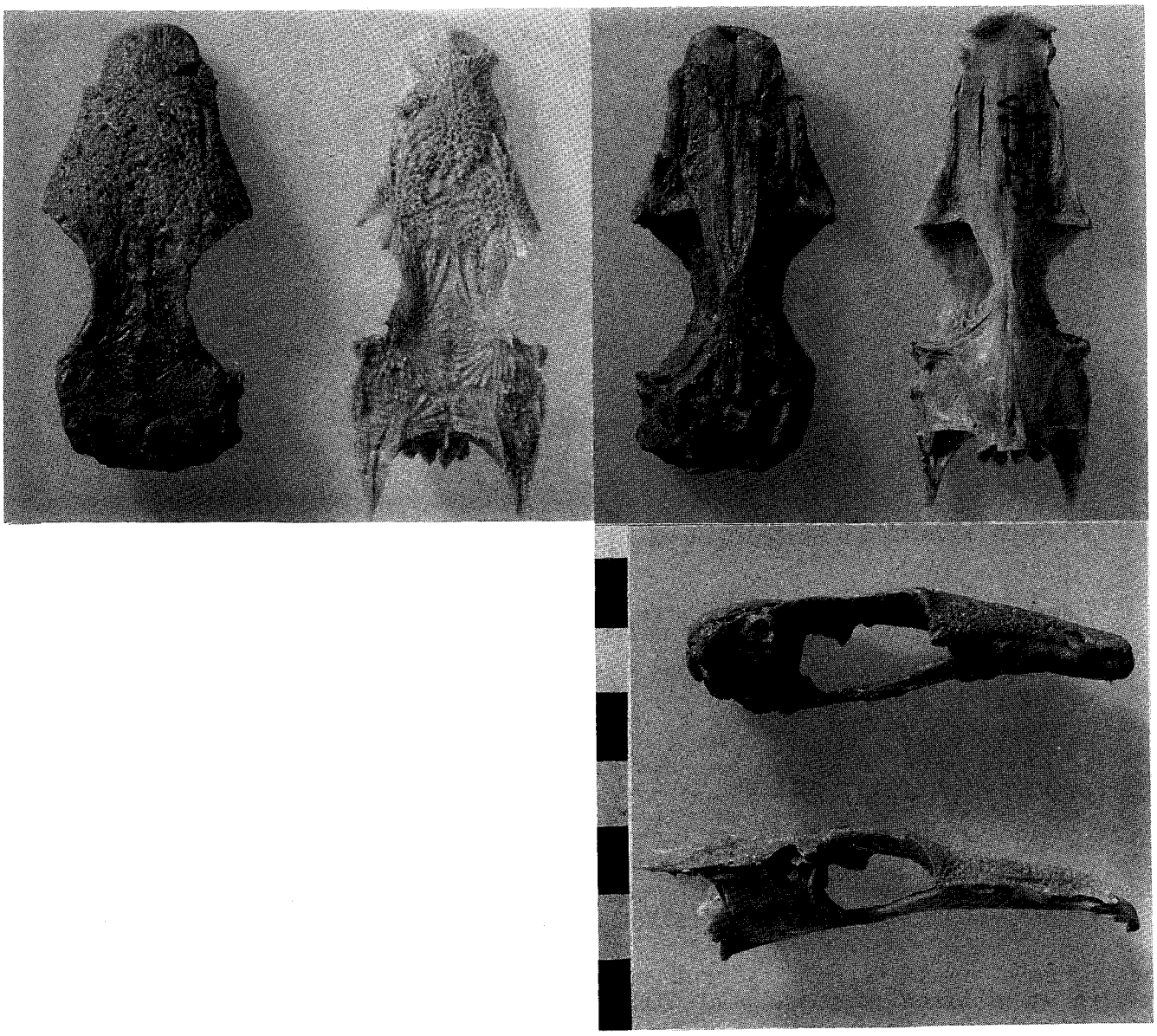

Figure 1. Dorsal, ventral, and lateral views of fossil *Prionotus* and *Prionotus evolans* NJSM B–214. Scale in centimeters.

Figure 2. X-ray posititive of fossil *Prionotus* from New Jersey. X 1.

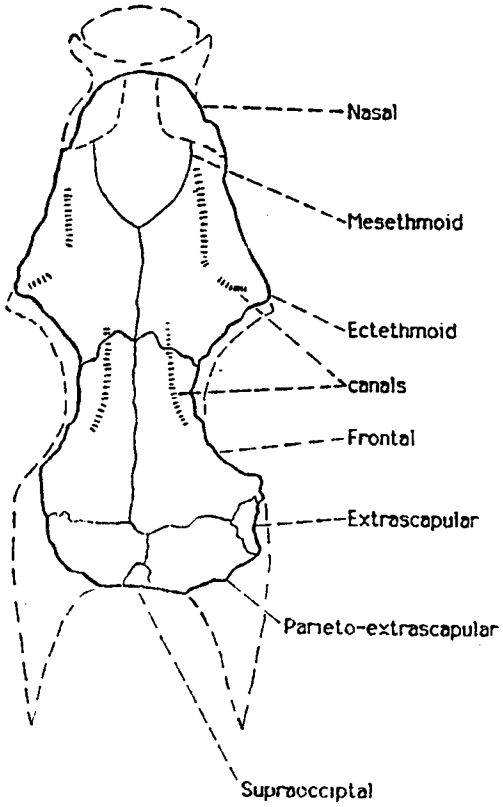

Figure 3. Diagram of the fossil *Prionotus* showing sutures, bones, and canals.

Wailes Bluff, St. Mary's County, Maryland	324153
Cape May, Cape May County, New Jersey	324065 - 324073
Fort Fischer, New Hanover County, North Carolina	392086, 392087
Old Dock, Columbus County, North Carolina	336112 - 336114
Shallotte, North Carolina	uncatalogued

The Fort Fischer specimens were discovered by Dr. Richard Laws at the University of North Carolina, who is currently working on the National Museum material (Laws, personal communication).

Prionotus belongs within the order Scorpaeniformes which contains most of the world's venomous fish, but is an order considered to be very provisional (Nelson, 1984). Scorpaeniformes are characterized by the head being armored with dermal bone external to normal cranial elements, and the suborbital bones braced against the face and preopercular (Romer, 1966). There are about ten *Prionotus* species in the western Atlantic Ocean from Nova Scotia to Venezuela, and their food includes mollusks, worms, crustaceans, and fish (Wheller, 1975). All species are bottom dwellers and are distributed from the outer shelf to near shore. The fish prefer sandy hard bottoms and use their pectoral rays like fingers to overturn stones in search of food (Jordan, 1907). *Prionotus* makes a drumming noise with its swim bladder, and buries itself to escape enemies (Fish, 1970).

Abbreviations used in this paper are:

AMNH	American Museum of Natural History
NJSM	New Jersey State Museum
RUGMV	Rutgers University Geology Museum Vertebrate Collection
USNM	National Museum of Natural History, Smithsonian Institution

Description of the Fossil *Prionotus*

The specimen was partially encased in a buff-colored calcareous sandstone containing small amounts of glauconite. The weathered portion of the cobble was soft and easily prepared by needles. Internally, the cobble was much tougher, but local application of dilute HCl to matrix in areas excavated mechanically proved successful in removing the matrix. Bone material was protected from the acid by heavy applications of Duco® cement. It was later suggested at the American Museum of Natural History that acid solutions buffered with $CaPO_4$ would effectively remove the calcite cement in the matrix and pose less danger to bone. The specimen was X-rayed to help locate the centers of ossification.

The skull is abraded through to the spongy portion in many areas. The right side of the skull was more encased in matrix, and therefore is more complete. The slightly raised portions of the frontals and ectethmoids found in the modern form are missing in the fossil, probably due to erosion. The erosion seems greatest in the anterior region of the eye sockets and has enlarged them in that direction. The parasphenoid and vomer are flatter than in modern genera, and this is also attributed to erosion. The nasal and vomer are broken anterior to the nasal aperture. The parieto-extrascapular is broken posteriorly. The epiotic and possibly the pterotic are present, but the occiptial region is

missing. The parasphenoid is broken in the occiptal region, but the arch ventral to the eye orbits remains.

Discussion

The specimen was compared with specimens of the living species *Prionotus evolans* and *P. carolinus*. The size and general proportions of the skull were closer to *P. evolans*. Four *P. evolans* specimens were used: NJSM B-214; AMNH 562275SD, 56348SD, 22442. The AMNH 22442 specimen was measured for comparison. That specimen most closely matched the fossil in size, and was from an individual 282 mm long. Skull proportions are about the same as in *P. evolans*, AMNH 22442; and the distances between the ossification centers of the frontals are 16 mm for both the modern and fossil forms. However, *P. evolans* is broader anterior to the orbits. The distance between the posterior edge of the modern frontals and the ossification center of the mesethmoid was nearly the same, being only 2 mm longer than in the fossil form. The fossil frontals were 6 mm longer than the modern species. Significantly, the supraoccipital extends forward onto the skull table from the nuchal line, as in the living species of *Prionotus*, instead of being surrounded by the skull table bones as it is in *Trigla* (Allis, 1909).

Table of Measurements
(measurements in millimeters)

	AMNH 22442 modern	RUGMV 1 fossil
Widths		
ossification centers of frontals	16	16
ossification centers of the ectethmoids	21	16
Lengths		
posterior of frontal to ossification center of mesethmoid	49	47
length of frontal	28	34
ossification centers of ectethmoids to ossification center of mesethmoid	21	16
ossification center of frontals to posterior of frontals	9	10

Stratigraphy

The Point Pleasant *Prionotus* skull is thought to be Pleistocene in age. Foraminifera present in the matrix include *Elphidium clavatum*, *E.* cf. *subarcticum*, and *Quinquiloculina*. Those genera indicate a shallow shelf environment and a sandy bottom, which is the environment frequented by modern *Prionotus*. Unfortunately, these foraminifera species only limit the specimen's age to late Miocene–Pleistocene (Olsson, personal communication).

Other facts tend to suggest a Pleistocene age for the skull. Known beach blocks from the Point Pleasant, New Jersey, area are either Pleistocene or Eocene (Parris, personal communication), and NJSM 13636 and 13637 are Pleistocene beach blocks with similar lithology. The major non-glacial Pleistocene unit in New Jersey is the Cape May Formation, which crops out in the Point Pleasant region (Salisbury, 1917) and which has produced nine other *Prionotus* fossils, USNM 324065 through 324073. Therefore, a Pleistocene date is strongly suspected for the Point Pleasant *Prionotus*.

Conclusions

The fossil specimen most closely resembles *Prionotus evolans*. The age is late Miocene or younger, and a Pleistocene date is suspected. Bone distribution on the skull argues for a new species, but uncertainties with even modern genera suggest caution. Therefore, erection of a new species of *Prionotus* must await a review of the fossil occurrences, and a consideration of the skull osteology of all the modern species.

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